

PATENT COOPERATION TREATY

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OCT 29 2004

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

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OCT 26 2004

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PCT

WRITTEN OPINION

(PCT Rule 66)

DUE ON JAN 20 2005 +

Date of mailing
(day/month/year)

20.10.2004

Applicant's or agent's file reference

83581-123PCT MAX WOOD

REPLY DUE

within 3 month(s)
from the above date of mailing

International application No.
PCT/CA 02/01681

International filing date (day/month/year)
01.11.2002

Priority date (day/month/year)
01.11.2002

International Patent Classification (IPC) or both national classification and IPC
G06T15/10

Applicant
CAE INC. et al.

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☒ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application
3. The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 01.03.2005

Name and mailing address of the international preliminary examining authority:



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I. Basis of the opinion

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

Description, Pages

1-26 as originally filed

Claims, Numbers

1-15 as originally filed

Drawings, Sheets

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
 - ☐ the language of publication of the international application (under Rule 48.3(b)).
 - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority in written form.
 - ☐ furnished subsequently to this Authority in computer readable form.
 - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
 - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.
4. The amendments have resulted in the cancellation of:
- ☐ the description, pages:
 - ☐ the claims, Nos.:
 - ☐ the drawings, sheets:
5. ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).
6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation (Form PCT/IPEA/405) to restrict or pay additional fees, the applicant has:

- ☐ restricted the claims.
- ☒ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied with for the following reasons and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees:

see separate sheet

3. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this opinion:

- ☒ all parts.
- ☐ the parts relating to claims Nos. .

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	13-15; NO
Inventive step (IS)	Claims	1-12: YES
Industrial applicability (IA)	Claims	

2. Citations and explanations

see separate sheet

Re Item IV

Lack of unity of invention

1. This International Preliminary Examination Authority found multiple (groups of) inventions in this international application, as follows:

First Invention, claims: 1-12: a system and method for rendering CLPs (calligraphic light points) in a 3D-to-2D mapping. Determination of occlusion/visibility of the CLPs. The colour portion of the CLPs can be replaced by "information" which is then used to access an occlusion counter.

Second Invention, claims: 13-15: a graphical processing unit and a data point for 3D-to-2D mapping. The colour portion of a data point (pel) can be replaced by "information" that "may" be used when said data point "may" be stored.
No mention of CLPs.

2. In the first invention (claims 1-12), the "information" replacing the CLPs colour portion appears to only play a marginal role in the determination of their occlusion/visibility. Claims 13-15 reciting the second invention show that said action of replacing can be carried out outside the context of the first invention.
The application thus relates to a plurality of inventions, or groups of inventions, in the sense of Rule 13.1 PCT.

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

2. First Invention, claim 1-12

2.1 Reference is made to the following documents:

D1: GB-A-2 265 801 (REDIFFUSION SIMULATION LTD) 6 October 1993 (1993-10-06)

D2: EP-A-0 507 550 (GEN ELECTRIC) 7 October 1992 (1992-10-07)

2.2 Documents D1 and D2 represent the prior art closest to the subject-matter of claim 1 to 12.

D1 discloses an image generator e.g. a flight simulator (page 1, lines 1-4) wherein a

number of parallel processors (page 9, lines 15-21) perform the mapping of 3D objects to the 2D display space (page 11, lines 17-23). After said 3D objects have been rendered in a raster image, calligraphic light points, hereinafter CLPs, are processed (page 70, lines 19-25). At each sampling point, CLPs are rendered taking into account of any possible occlusion by translucent objects nearer to the viewing point than the CLP, so that CLPs can be attenuated; the combined attenuation are stored in a weighting and accumulation device 93 (page 71, lines 8-16).

D2 describes a method for resolving occlusion in a combined raster-scan / calligraphic display system (cf. title). 3D objects are rendered first using conventional Z-sorting (abstract; column 5, lines 40-47). The rendering of CLPs is then performed (column 5, lines 37-52), whereby the occlusion relationship amongst CLPs is checked and accumulated in a subpixel record (column 6, lines 26-58). In a final stage, raster scan data of the rendered 3D objects is combined with the accumulated CLP data, again taking into account of their distance from the viewing point (column 7, lines 7-41).

- 2.3 Neither D1, nor D2, nor any other available document discloses the (2D) rendering of 3D objects and of CLPs where the colour portion of the CLPs data can be replaced by information then used in the calculation of their occlusion state, as recited in claims 1 and 10.

Consequently, the subject-matter set out in the present claims, and particularly in claims 1 and 10, is considered to be novel and non-obvious with respect to the disclosures of the available prior art. It is also evident that the invention is industrially applicable.

The requirements of paragraphs (1) to (4) of Article 33 PCT are thus met.

3. Second Invention, claim 13-15

- 3.1 Reference is made to the following documents:

D3: EP-A-0 366 309 (IBM) 2 May 1990 (1990-05-02)

D4: US-A-5 621 869 (DREWS MICHAEL D) 15 April 1997 (1997-04-15)

D5: US-A-5 467 110 (WHITE JAMES M ET AL) 14 November 1995 (1995-11-14)

- 3.2 Any one of documents D3 to D5, discloses (cf. citations of the ISR) that it has been common prior art practice to replace colour intensity values with index values that address a colour LUT, so that a larger colour space can be displayed without

excessive (display) memory resources.

Claim 13-15 are drafted in such a vague and broad manner that the claimed "digital information" may well be identified with the prior art LUT index.

The prior art LUT index that replaces the colour value of a mapped pixel is instrumental in determining how to store the pixel colour values in the display memory and in the colour LUT for later retrieval. Hence, it can be said that the prior art pixels are "stored according to the digital information" (cf. claims 13 and 14) that is represented by said prior art LUT index values, and that by identifying the pixel colour in the LUT, said index values identifies the pixels (cf. dependent claim 15).

- 3.3 For the above reasons, the subject-matter of claims 13 to 15 appears to be anticipated by the prior art such that the criterion set forth in Article 33(2) PCT is not satisfied and the question concerning novelty of Article 33(1) PCT must be answered negatively.